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High Anxiety: The Trade War and China's Oil and Gas Supply Security

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"If Oil Supplies Are Cut Off, How Much Oil Does China Have?"

—Cover of the June 15, 2019, issue of China Petroleum & Petrochemical ***[1]***

"Is China's Oil Supply Still Secure?"

—Cover of the August 15, 2018, issue of China Petroleum & Petrochemical ***[2]***

Introduction

In summer 2018, China's president Xi Jinping, facing pressure from the US-China trade war, intervened in a long-running debate within China's oil industry about the extent to which national security concerns or market forces should determine domestic oil and natural gas production. Xi effectively tipped the scales in favor of advocates of prioritizing self-sufficiency over cost as part of a broader push for self-reliance amidst trade tensions. As a result, China's national oil companies (NOCs) are accelerating investment in domestic exploration and production. While this ramp-up in spending is likely to result in an increase in output, especially of natural gas, it is unlikely to alter China's substantial and growing reliance on oil and natural gas imports. However, the trade war probably will continue to contribute to shifts in the composition of China's import portfolio, with both traditional and new suppliers gaining shares as a result of the slowdown in the flows of US liquified natural gas (LNG) and crude oil to China and decreases in deliveries of Iranian and Venezuelan crudes due to US sanctions.

Xi instructed China's NOCs to ramp up domestic exploration and production of oil and natural gas to enhance national energy security in July 2018. Xi's directive is consistent with his championing of self-reliance in response to the US-China trade war. The trigger for Xi's embrace of self-reliance was the US Department of Commerce's imposition in April 2018 of an export ban to China's telecommunications equipment manufacturer ZTE that threatened the Chinese national champion's survival. Although the Department of Commerce lifted the ban in July 2018, the incident underscored for Beijing the risks of relying on imports, especially from the United States, for critical inputs into the Chinese economy. These inputs

include not only semiconductors and the Android operating system but also oil and natural gas as well as exploration and production equipment and technology. Even though there is a chance of a trade truce as of this writing, such a truce probably would not significantly affect the Chinese leadership's impulse toward greater self-reliance, in part because Chinese officials appear to have concluded that the US is an unreliable partner.

Xi's directive spurred China's NOCs to release their first ever seven-year plans for accelerating the development of domestic oil and natural gas resources and to increase their exploration and production budgets in 2019 to the highest levels in five years. The companies' actions mark a shift away from a relatively laissez-faire period in the mid-2010s, when low oil prices prompted them to reduce domestic output and upstream spending and import more oil. These decisions were not without controversy. They rekindled a debate with China's oil industry about the extent to which China, the world's largest importer of oil and natural gas, should double down on trying to find and produce more oil at home or take advantage of lower prices to purchase more oil from abroad. Xi's call for China's oil companies to grow domestic output effectively gave the edge to proponents of enhancing supply security through increased domestic production.

Despite the high-level political support for expanding domestic output, it is extremely unlikely that China's oil companies will be able to meaningfully slow the growth of the country's imports. An executive at PetroChina, the country's largest oil and gas producer, publicly stated in 2018 that China does not have the resources to keep pace with demand growth. PetroChina's parent company, China National Petroleum Corporation (CNPC), expects China's dependence on oil and natural gas imports to increase through 2030 from 70 percent and 44 percent,

respectively, in 2018 (with reliance on gas imports growing more rapidly than reliance on oil imports).

Although decreases to China's reliance on oil and natural gas imports are unlikely, the trade war may nonetheless continue to bring about shifts in the composition of China's oil and natural gas import portfolios. Since President Donald Trump officially launched the trade war in July 2018 with the imposition of a 25 percent tariff on Chinese goods worth $50 billion, China's NOCs have curbed their purchases of LNG and crude oil from the United States, which appeared to be on track to become a much larger supplier of both to China pretrade war. Meanwhile, China's NOCs have been buying more from traditional suppliers, with deliveries of LNG from Australia and crude oil from Saudi Arabia increasing substantially. Although China is likely to import more energy from the US after the trade war ends, with LNG supply agreements almost certainly part of a trade agreement, a key question is the extent to which China wants to rely on imports from the United States given concerns about the willingness and ability of the US to disrupt the flow of energy and other critical inputs into the Chinese economy from not only the US but also third countries due to sanctions.

This commentary examines how the US-China trade war is affecting what China is saying and doing about oil and natural gas supply security. Part one assesses how trade tensions have heightened concerns in Beijing about the security of China's oil and natural gas supplies and related equipment and technology. Part two examines the response of China's government and oil companies to Xi's call for increased domestic oil and natural gas production. Part three explains why major changes to China's dependence on imports are unlikely. Part four explores how the trade war is affecting—and might affect—the composition of China's import

portfolio. Part five examines demand management, a key tool for slowing import growth, that has been absent from some of the production-centric Chinese discussions about enhancing oil and gas supply security.

Trade War Intensifies Supply Security Concerns

The US-China trade war, including US sanctions on Chinese technology companies, has heightened China's anxiety about the security of its oil and natural gas supplies by highlighting the dangers of excessive reliance on other countries for critical inputs into the Chinese economy. The US Department of Commerce's ban on exports to telecommunications equipment manufacturers ZTE and Huawei in April 2018 and May 2019, respectively threatened the survival of both firms.[3] Trump subsequently linked the relaxation of these export bans to the US-China trade war. In May 2018, he told the Department of Commerce to help ZTE, which ceased operations due to the export controls, resume operations, noting that his instruction "is also reflective of the larger trade deal we are negotiating with China and my personal relationship with President Xi."[4] In May 2019, Trump made a similar linkage between the fate of Huawei and bilateral trade negotiations, stating that "it's possible that Huawei would be included in a trade deal."[5]

The US export controls spurred Xi to call for greater self-sufficiency in key inputs China buys from other countries. On April 26, 2018, Xi said China must rely on itself for "core technologies."[6] On September 27, 2018, Xi noted that "internationally, it's becoming more and more difficult to obtain advanced technologies and key know-how. Unilateralism and

trade protectionism are rising, forcing us to adopt a self-reliant approach."[7]

Xi's call for greater self-reliance extends to oil and natural gas. In July 2018, he told China's government agencies and major oil companies to study and quickly implement measures to increase domestic oil and natural gas exploration and production to ensure national energy security.[8] Articles published in the newspapers of two of China's NOCs, CNPC and Sinopec, indicated that Xi's instruction is rooted in his concern that China's growing dependence on imported oil and natural gas may pose major challenges.[9]

China's NOC executives have echoed Xi's call for greater self-reliance, with some explicitly referencing the US-China trade war as a driver. On May 29, 2019, Fu Chengyu, the former chairman of CNOOC and Sinopec, told the Shanghai Derivatives Market Forum that China should be prepared for an oil supply cutoff in the short term in a speech about enhancing China's energy security through greater energy self-sufficiency.[10] On that same day, Wang Yilin, the chairman of CNPC and its internationally listed subsidiary, PetroChina, convened a meeting within CNPC on coping with the US-China trade war. He told employees to prepare for a "protracted and complex" trade dispute and called for greater innovation and localization to prevent key technical equipment from being cut off by foreign suppliers.[11] China's oil industry relies on American suppliers for a variety of technologies and equipment, especially for the exploration and production of unconventional and deep water oil and natural gas.[12]

Wang's exhortation for increased innovation and localization reflects the concern in China's oil industry that the United States might extend the

export bans implemented against Huawei and ZTE to Chinese oil companies.

- Researchers at CNPC and China State Shipbuilding Corporation, in the August 2019 issue of a CNPC journal, warn that if the United States government forbids US firms from doing business with China's oil companies, it will impact affect areas where China lags behind the United States, such as drilling, logging, offshore engineering, and the exploration and production of offshore oil and natural gas and unconventional oil and natural gas.[13]
- An article published in the Global Times on August 14, 2019, quotes Wu Xiaolin, an oil expert with the Daqing Oilfield Company, a subsidiary of CNPC, as saying "under the restraints of the US at present, Daqing is making efforts to achieve the total nationalization of oil extraction technology, just as Huawei is developing the Harmony OS."[14] (Harmony OS is the platform Huawei plans to deploy when it can no longer access the Android system due to the US export ban.[15])
- In August 2018, Pan Jiping, a senior analyst with China's Ministry of Land and Resources, said regarding deep water exploration and production: "Once the technology is sanctioned by Westerners, all our production systems will have to shut down. It's not impossible that the case of ZTE will happen in our deepwater oil and gas development sector."[16]

Although there currently does not appear to be momentum in Washington for prohibiting the sale of technology and equipment to China's oil companies, the concerns of Wang and others in China's oil industry are understandable. After all, economic sanctions are a popular foreign policy tool of the Trump administration.[17] Moreover, Washington

issued sanctions against Russia in July 2014 that prohibit the provision of goods and services or technology for the exploration and production of oil from deep water, shale, and the Arctic offshore.[18]

US sanctions on Iran and Venezuela probably have intensified concerns in Beijing about the threat the United States poses to China's oil supply security by highlighting the willingness and ability of Washington to disrupt the flow of oil to China from third countries. China's oil imports from Iran fell by 46 percent from 657,000 barrels per day (bpd) in January–September 2018 to 357,000 bpd in January–September 2019.[19] Similarly, China's imports of Venezuelan crudes dropped by 15 percent from 360,000 bpd to 306,000 bpd over the same period.[20] Concerns about the NOCs' ability to find replacements for Iranian and Venezuelan crudes may have contributed to Beijing's decision to delay implementing a tariff of US crude oil imports until September 1, 2019.[21]

A New Domestic Battle for Oil (and Gas)

China's NOCs have responded to Xi's directive for increased exploration and production in word and deed. Rhetorically, CNPC is using the same language of war to describe its efforts to find more oil at home that China's leaders used to characterize China's drive to become self-sufficient in oil in the 1960s. In February 1960, China's leaders launched the "great battle for Daqing oil" with the mobilization of tens of thousands of workers to develop China's largest oil field, discovered in 1959.[22] Nearly 60 years later, CNPC is talking about waging a new battle for oil. In August 2018, company leaders met to discuss Xi's directive and agreed to launch a "major offensive war" on domestic exploration and

development to enhance national energy security. The company's newspaper noted that this war involves "winning the hard battle" to change the view that China does not have any more oil resources to explore and develop.[23]

China's NOCs have raised their capital expenditures (CAPEX) to fight this new "battle for oil." PetroChina, CNOOC Ltd. and Sinopec Corp. (the internationally listed subsidiaries of CNPC, CNOOC, and Sinopec, respectively) boosted their exploration and production budgets for 2019 to the highest levels since 2014 (see figure 1). PetroChina, CNOOC Ltd., and Sinopec collectively plan to spend US$52.6 billion on domestic exploration and production in 2019, up 21 percent from US$43.5 billion in 2018.[24] The majority of the new investment in China's upstream will come from PetroChina, which has earmarked US$33.1 billion for exploration and production.[25] CNOOC Ltd. is the only one of the three NOCs to publish information on how much of its 2019 CAPEX will be spent at home. The company has allocated 62 percent of its upstream CAPEX for domestic projects in 2019, the highest amount it has spent in China since 2012 (see figure 2).[26]

Figure 1. Upstream CAPEX of China's NOCs (US$ billion)

Source: Company reports

Figure 2. Upstream CAPEX allocation by CNOOC Ltd.

Source: Company reports

In early 2019, CNPC, CNOOC, and Sinopec each released seven-year action plans to intensify domestic exploration and production in 2019–2025.[27] Collectively, the broad objective of these blueprints is to stabilize oil output and increase natural gas production.[28] Although the plans are not publicly available, the companies have released some information about their objectives. CNOOC, for example, intends to double its exploration workload and proven reserves by 2025.[29]

Meanwhile, CNPC and Sinopec are eying unconventional gas as a source of growth, despite complex geology and above-ground challenges that likely will result in China missing its 2020 shale gas production target of 30 billion cubic meters (bcm).[30] This focus probably reflects both the maturity of their oil assets and Beijing's introduction of a revised subsidy scheme for unconventional gas, which now covers tight gas in addition to shale and coalbed methane.[31] CNPC, for example, is targeting shale gas production of 24 bcm in 2025.[32] (For comparison, China's shale gas production in 2018 was 10 bcm, 7 percent of total gas output, with CNPC contributing 4 bcm.[33]) Sinopec, which has been more reticent than its peers about its seven-year plan, also appears to be focusing on shale gas; a substantial portion of its 2019 upstream CAPEX is budgeted for expansion of the Fuling shale, arguably China's best shale asset.[34]

The NOCs are making progress in stabilizing oil and increasing natural gas production. During January–September 2019, China's crude oil output was 3.84 million bpd, an increase of 1.2 percent over the same period in 2018.[35] Meanwhile, the country's natural gas production in January–August 2019 was 128 bcm, up 9.5 percent from the same period in 2018.[36] Zhang Jianhua, the head of China's National Energy Administration, expects that in 2019, China's annual oil output will increase by 20,000 bpd

to 3.87 million bpd, and annual natural gas production will grow by 10 bcm to reach 170 bcm.[37]

A Retreat from Laissez-Faire Production Policy

With his call to increase China's domestic oil and natural gas production, Xi effectively signaled a retreat from a period in which China's NOCs allowed market forces to play a larger role in determining domestic oil production.[38] The collapse in crude oil prices from $99 in 2014 to $52 in 2015 and $44 in 2016 forced China's oil companies to make a choice between maximizing domestic production and minimizing costs.[39] At the time, the average production cost in China was $40–$50 per barrel.[40] In late 2015 and early 2016, the price of Brent crude was below these levels.[41]

China's oil companies opted to prioritize cost over self-sufficiency. In February 2016, Sinopec announced that it would close four oil fields in the complex of fields known as Shengli, which had been operating for more than five decades, for the first time ever after Shengli registered losses of $1.4 billion in 2015.[42] The following month, Wang Dongjin, then the president of PetroChina, said the company would close oil fields "that have no hope of making profit under current oil prices."[43] Yanchang Petroleum, a company owned by the government of Shaanxi province, also announced plans in February 2016 to decrease output by 4,000 bpd in that year to improve the company's performance.[44] These output cuts were the first ever deliberate reduction of domestic oil production in China.[45] The production cuts contributed to a three-year decline China's production, which peaked at 4.3 million bpd in 2015 and then fell to 3.8 million bpd in 2018.[46]

The crude oil price collapse was not the only reason China's oil output fell after 2015. The underlying driver was the maturity of China's largest oil fields and the difficulty in finding replacement reserves.[47] As one NOC manager put it, "Without rice in hand, you can't make a meal."[48] Production at fields including Daqing and Shengli had already plateaued before the crude price collapse.[49] The plunge in oil prices merely accelerated a decline in production that was already underway due the age of China's "backbone" fields.

China's NOCs opted to take advantage of the low oil prices to buy more oil on the international market to offset declines in domestic production and fill commercial and strategic stocks.[50] According to Chinese oil industry insiders, domestic oil companies face huge cost pressures at $40 per barrel, a level at which "producing oil is not as cost effective as buying oil."[51] China's crude oil imports increased by 13.6 percent in 2016, the highest annual growth rate since 2011.[52] (Purchases by independent refiners that granted permission to import and run imported crude beginning in 2015 were also a factor.[53])

The move to cut production was part of a broader shift in the strategies of China's NOCs away from prioritizing growth and toward prioritizing returns. The initial impetus for this change in direction was the collapse in the NOCs' returns. PetroChina's return on equity, which peaked at close to 30 percent in 2005, fell to 10 percent in 2012. Similarly, Sinopec's return on equity declined from its peak of 20 percent in 2006 to 12 percent in 2012. With less money to spend, China's NOCs made virtue of necessity.[54]

In March 2014, PetroChina's then-chairman Zhou Jiping explained his company's change in focus while announcing PetroChina's first ever reduction in CAPEX. According to Zhou, "the company has adjusted its

development policy from the original emphasis on scale and speed to quality and efficiency. We will strictly manage investment and focus on returns, continuously optimize investment structures, rationally adjust the pace of project construction, and control the total amount of investment."[55]

The decrease in domestic production and CAPEX and increase in imports reignited a debate within China's oil industry about the extent to which China should rely on oil imports.[56] The "buy oil" camp maintains that importing oil is the most cost-effective way to meet China's oil requirements, especially when prices are low. The "produce our own oil" camp contends that domestic production is the most reliable source of oil for China and regards the position of the "buy oil" camp as shortsighted and dangerous due to risks associated with changing market conditions and geopolitics.

Xi effectively sided with the "produce our own oil" camp with his directive to increase domestic output, raising the question of whether the NOCs will sacrifice returns for growth. Some industry analysts have said that there is a risk political pressure will prompt the companies to pursue commercially marginal projects.[57] Others, however, have noted that the NOCs have the capacity to absorb high spending, due in part to the belt tightening after the oil price collapse.[58]

Big Changes to China's Imports Are Unlikely

The NOCs' greater investment in domestic exploration and production is unlikely to substantially slow the growth of China's oil and natural gas

imports because of limits on the extent to which the companies can increase output. Zhang has indicated that he harbors no illusions about China's ability to reduce its dependence on oil and natural gas imports through efforts to increase domestic supply. In August 2018, when Zhang was a vice chairman of PetroChina, he said, "Domestic oil and gas resources are not good enough for significant production increases," on the sidelines of the company's interim briefing in Hong Kong.[59]

This assessment is especially true for oil. Zhang stated in September 2019 that he expects China's oil production to increase by 200,000 bpd from 3.8 million bpd in 2018 to 4 million bpd by 2022.[60] 200,000 bpd was just 2 percent of China's crude oil imports in 2018.[61]

Projections released in August 2019 by the CNPC Economics and Technology Research Institute (ETRI), a unit of PetroChina's parent company, reveal that it expects China's crude oil imports to continue to grow. Specifically, ETRI projects that in 2030 China's oil demand will peak at 14.2 million bpd, with domestic production around 4 million bpd.[62] This implies imports of 10.2 million bpd, an increase of nearly 1 million bpd over the 9.24 million bpd China imported in 2018.[63] As a result, China's reliance on imports will increase slightly from almost 70 percent in 2018 to 72 percent in 2030.[64]

ETRI also expects that China's natural gas imports will increase substantially. The research institute projects that natural gas imports will surge from 123 bcm in 2018 to 310 bcm in 2035 as part of Beijing's efforts to expand natural gas use to combat air pollution.[65] As a result, China's dependence on natural gas imports will rise from 44 percent in 2018 to 51 percent in 2035.[66]

The Trade War, Sanctions, and China's Import Portfolio

The US-China trade war has effectively paused the development of more robust bilateral energy trade. Zhang said as much in a press briefing on September 20, 2019: "If there is no trade war, we can import crude oil and natural gas from the United States. But because of the trade war, there is no way we can once again import from the United States. Because of the increase in tariffs, enterprises can't afford it."[67] The previous month, PetroChina executive director and president Hou Qijun said, "The US is a fast-growing LNG exporter, and it would be a promising supplier for China if there were no trade tension. The US would have been a very promising gas supply growth source for China."[68]

LNG Imports

The trade war has put China's imports of US LNG on hold. China began purchasing LNG from the United States in 2016, the year the United States started exporting LNG from the lower 48 states. After peaking at 506,485 tons in January 2018, China's purchases of US LNG plunged to zero in September 2018 and remained low through the rest of the year due to Beijing's imposition of a 10 percent tariff on US LNG on September 24 in response to US tariffs imposed on $200 billion of Chinese goods and uncertainty about the trade war (see figure 3).[69] Beijing's move to increase the tariff on US LNG to 25 percent on June 1, 2019 in response to the US increase in levies on $200 billion of Chinese goods makes it unlikely that there will be an uptick in Chinese imports of LNG as long as the trade dispute remains unresolved.[70]

Figure 3. China's LNG imports from the US (tons)

Source: Customs Statistics, http://43.248.49.97/indexEn

With US exporters shut out of the Chinese market, China has turned to other suppliers, notably Australia, to meet its growing demand for LNG imports. Australia accounted for 65 percent of the growth in China's LNG imports in the 12 months after China first imposed a tariff on US LNG. However, the Australian government, in an assessment of the increase in Australian LNG deliveries to China in October 2018–April 2019, notes that it is difficult to directly attribute this growth to the tariff because of the rapid growth in China's LNG demand and the start-up of new export projects in Australia during this period.[71] Other LNG exporters that increased deliveries to China in October 2018–September 2019 include Malaysia and Russia (see figure 4).[72]

Figure 4. China's LNG imports from selected suppliers (tons)

Source: Customs Statistics, http://43.248.49.97/indexEn

Russia is likely to benefit from a protracted US-China trade war. The Power of Siberia natural gas pipeline is scheduled to start deliveries to China in December 2019 and gradually ramp up to its full capacity of 38 bcm.[73] In addition, CNPC has contracted to buy 3 million tons per year of LNG from Novatek's Yamal project in the Russian Arctic, in which CNPC owns a 20 percent stake.[74] CNPC and CNOOC each purchased 10 percent stakes in Novatek's Arctic LNG-2 project in June 2019.[75] Novatek plans to send around 80 percent of its production to the Asia-Pacific region, making it likely that some of it will be delivered to China.

[76] These projects undoubtedly contributed to Wang Yilin's assessment in June 2019 that Russia will become China's largest supplier of natural gas in the "near future."[77]

Moreover, the longer the trade war drags on, the more attractive Russia may become to China as a supplier of additional volumes of pipeline gas.[78] One relatively easy way for Russia to export more gas to China is to add compressor stations along the Power of Siberia pipeline, which could increase capacity by 12 bcm to 50 bcm.[79] A more complex project would be the construction of the 30 bcm Power of Siberia 2 pipeline (previously known as the Altai pipeline) from West Siberia to Western China, which would require extensive infrastructure construction in China.[80] Moscow's enthusiasm for the project historically has been greater than Beijing's.[81] However, it is worth noting that the Chinese government's interest may have increased. According to Russia's energy minister, Xi "set the task of getting approval for gas supplies via the western route [Altai] during the shortest possible time" during a meeting with Russian president Vladimir Putin in September 2018.[82]

That said, Chinese LNG purchases likely will be part of any trade deal. An executive with CNOOC, China's largest LNG importer, said as much in April 2019 on the sidelines of the LNG 2019 conference in Shanghai. According to CNOOC vice president Li Hui, "For China-US LNG trade, you have to look at the big trends and at the trade frictions. If this problem can be solved appropriately, LNG trade could be very big."[83] How much US LNG Chinese buyers are willing to purchase, however, is an open question, the answer to which depends in part on whether China's demand for natural gas surprises on the upside and the extent to which Chinese firms regard the United States as a reliable supplier.

Crude Oil Imports

The trade war has also stymied the flow of US crude oil to China, which began in 2016. China imported 247,000 bpd of crude from the United States in 2018.[84] Unipec, Sinopec's trading arm and the main Chinese buyer of US crude, had planned to purchase 300,000 bpd in 2018 and 500,000 bpd in 2019 in a bid to diversify its imports away from Africa and the Middle East.[85] Imports from the US also avoid the Strait of Hormuz and the Strait of Malacca, the world's two most important strategic choke points by volume of oil transit.[86]

Trade tensions, however, prompted Unipec to put its plans for increased US crude purchases on hold. The company suspended its imports of US crude in September 2018 due to the trade war. Unipec did not resume purchases until April 2019.[87] (China's independent refineries bought the US crude that arrived in China in the interim.[88]) However, US sanctions on Iran and high premiums for Saudi and other Middle Eastern crudes spurred Unipec to start buying US crudes again.[89] As a result of the near cessation of US crude deliveries to China in the first quarter of 2019, China's imports of US crude in January–September 2019 were down 57 percent from the same period a year earlier (see figure 5).[90]

Figure 5. China's crude oil imports from the US (bpd)

Source: Customs Statistics, http://43.248.49.97/indexEn

As China's imports of US crude oil waned, other exporters increased deliveries to China, notably Saudi Arabia (see figure 6). The country's exports to China surged by 55 percent from 1,032,000 bpd in January–August 2018 to 1,603,000 bpd in January–August 2019. That said, it is

unclear how much of this growth in Saudi deliveries to China is a direct result of the trade war. Other factors include Saudi Aramco's supply agreements with two independent refiners and the tightening of US sanctions on Iran.[91] As a result of the dramatic increase in Saudi Arabia's crude exports to China, the kingdom is likely to replace Russia as China's top crude oil supplier on an annual basis for the first time since 2015.[92]

Malaysia was the second largest source of incremental crude deliveries to China in January–September 2019, increasing its exports to 378,000 bpd from 163,000 bpd over the same period in 2018.[93] According to a report by S&P Global Platts, this surge in Malaysian deliveries, which are primarily composed of blended foreign crudes, is probably the result of US sanctions on Iran and Venezuela, which sold medium and heavy crudes as baseload supply to China's independent refiners.[94] The report notes that the surge in China's imports of Malaysian blends crudes coincided with the removal of the independent refiners' preferred Iranian and Venezuelan crudes from normal trading channels due to sanctions. Moreover, some of the blended crudes are very similar to some Venezuelan grades.[95] Other industry analysts suspect some of the barrels China imports from Malaysia are transshipped from Venezuela.[96]

Brazil was the third largest source of incremental crude deliveries to China in January–September 2019. China's imports of Brazilian crude increased by 172,000 bpd over the same period in 2018 to reach 783,000 bpd.[97] China's independent refineries were a major driver of this growth.[98] Industry analysts regard the trade war and US sanctions on Iran and Venezuela as providing a good opportunity for Brazil to further expand its share of China's crude oil imports.[99]

Figure 6. China's crude oil imports from major suppliers (bpd)

Source: Customs Statistics, http://43.248.49.97/indexEn

The extent to which Beijing's imposition of a 5 percent tariff on US crude oil imports on September 1, 2019, will dampen China's appetite for US crudes probably will depend in part on whether there are any reductions in the volume of deliveries from the country's major suppliers, especially in the Persian Gulf. After Beijing announced the tariff on August 15, 2019, a Sinopec executive said, "We are unlikely to take much US crudes as they attract 5 percent tariff now."[100] One month later on September 14, after attacks on Saudi Arabia's oil infrastructure temporarily halved the kingdom's crude oil output, Unipec increased its purchases of US crudes.[101] The current elevated prospect of a crisis in the Strait of Hormuz, through which more than 40 percent of China's crude oil imports transited in 2018, probably heightens the attractiveness of the United States as a crude supplier to China despite the fact that China's NOCs probably would prefer not to ramp up US imports during the trade war.

What about Demand Management?

In China, some recent discussions of efforts to slow the growth of China's oil and natural gas imports were largely centered on expanding domestic supplies.[102] But Xi and other senior Chinese leaders also emphasize the role demand-side management can play in reducing China's oil and natural gas consumption and advancing other policy objectives, including combating pollution and climate change and enhancing the global competitiveness of various Chinese industries. Indeed, when

China's leaders talk about energy security, they typically pair remarks about increasing production with moderating consumption.

- On June 13, 2014, Xi discussed the need to "restrain irrational energy consumption" and control overall energy use while diversifying China's energy mix during remarks to the Central Finance and Economics Leading Small Group, in which he called for a revolution in China's energy production and consumption.[103]
- On January 8, 2019, when Politburo standing committee member Han Zheng spoke to the National Energy Administration about ensuring national energy security, he not only discussed growing domestic oil and natural gas supplies but also called for the healthy development of new energy vehicles (NEVs) in remarks about the need to develop new energy technologies.[104] (The Chinese government uses the term NEV to refer to vehicles powered by fuels other than petroleum; almost all NEVs in China currently are plug-in electric vehicles with batteries. [105])
- On October 11, 2019, Premier Li Keqiang chaired a meeting of China's National Energy Commission in which he talked about ensuring national energy security not only through growing supplies and increasing oil and natural gas self-sufficiency but also transforming the structure of energy consumption.[106]

The Chinese government's promotion of NEVs, which long predates the trade war, is likely to be one of China's most effective tools for slowing oil import growth because vehicles account for more than 40 percent of China's oil consumption.[107] Indeed, the "Energy Saving and New Energy Auto Industry Plan" for the period 2012–2020, released by the State Council in June 2012, states that the development of NEVs is an urgent

task to relieve energy and environmental pressures.[108] Beijing aims for NEVs, which composed around 5 percent of vehicle sales in early September 2019, to account for around 25 percent by 2025 and is reportedly considering targets of 40 percent by 2030 and 60 percent by 2035.[109] The central government has adopted a number of policies to facilitate the achievement of these goals to include subsidies, tax exemptions, support for charging infrastructure, and a requirement that each Chinese vehicle manufacturer and importer makes or imports at least 10 percent of its vehicles in 2019 and at least 20 percent in 2020.[110]

Beijing's efforts to slow the growth of oil consumption in transportation also include fuel efficiency standards.[111] Each vehicle is required to achieve specific fuel efficiency standards for its weight. Additionally, each vehicle manufacturer must meet Corporate Average Fuel Consumption limits, which apply on an annual basis to the manufacturer's new vehicle fleet.

Meanwhile, Premier Li proposed substituting electricity for oil in rail transport and using electricity instead of oil to power airplanes docked at airports during his remarks at the meeting of the National Energy Commission on October 11, 2019.[112] This call for decreasing the use of oil by railways is consistent with China's 13th Five-Year Plan for Railways, which has strengthening the electrification of railways as one of its goals.[113] Li's proposal also dovetails with his enthusiasm for building more high-speed railways in China.[114]

Conclusions

- The US-China trade war has underscored for China's leaders the risks of relying on foreign countries for inputs critical to the functioning of China's economy. The US export bans to ZTE and Huawei, in particular, undoubtedly have raised questions in Beijing about the reliability of the United States as a supplier of such critical inputs. It would hardly be surprising for Chinese officials and oil executives to conclude that if Washington is willing to take actions to stop the sale of semiconductors produced by American firms to China (and threaten the very survival of two of China's national technology champions in the process), it might also be willing to disrupt not just the flow of US energy to China but also technology and equipment that China needs for domestic oil and natural gas production.
- Although US LNG will remain largely shut out of the China market while the trade war remains unresolved, Chinese purchases of LNG undoubtedly will be part of any US-China trade agreement. China needs the gas, and the large numbers associated with LNG supply contracts are likely to appeal to Trump, who has been touting the $50 billion worth of agriculture products he says the Chinese committed to purchase in October 2019 as part of an oral "agreement in principle" on a preliminary trade deal.[115] However, a key question is the extent to which China will want to be dependent on the US for LNG in light of Washington's willingness and ability to disrupt the flow of critical inputs into the Chinese economy not only from the United States but also third countries.
- The extent to which China's NOCs purchase US crude while the trade war continues will depend in part on how much they further curb purchases from Iran in response to US pressure and whether there are

additional disruptions in crude flows from key suppliers, such as the one created by the attacks on Saudi Arabia's oil infrastructure. Although China's NOCs may be reluctant to ramp up US crude purchases with the trade war unresolved, a crisis in the Strait of Hormuz may prompt them to seek more crude from the United States to increase the volume of Chinese imports that do not transit the strait.

- The decrease in US oil and natural gas flows to China has helped create an opportunity for other exporters to gain a larger share of China's imports than they might have secured otherwise. Deliveries of Australian LNG and Saudi crude to China have surged. The trade war and US sanctions on Venezuela and Iran have supported Brazil's plan to increase its share of China's crude oil imports and contributed to a surge in Malaysian deliveries composed of foreign blended crude and perhaps some barrels transshipped from Venezuela. Meanwhile, Russia, which is on track to become one of China's largest—if not the largest—supplier of natural gas, might stand to benefit even more. The longer the trade war drags on, the more likely China is to view Russia as an even more attractive supplier of natural gas.

China's efforts to increase oil and gas self-sufficiency almost certainly will continue to involve more production and more substitution. Given the limits on ramping up domestic production, efforts to decrease the consumption of oil in the transportation sector will remain an important component of China's approach to slowing the growth of the country's oil imports.

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